

WHAT IS CLAIMED IS:

1. A PC card control apparatus, comprising:
 - a PC card connector configured to provide
 - 5 connections for connecting one of a first PC card compliant with specific card standards and a card-adapting card for connecting a second PC card compliant with a different card standard to the PC card control apparatus;
 - 10 a card detector configured to detect connection of the card-adapting card to the PC card control apparatus and to subsequently output a detection signal; and
 - an interconnection switching circuit configured to switch the connections of the PC card connector to
 - 15 connect the PC card connector to a bus interface dedicated to the second card upon receiving the detection signal from the card detector.
2. The PC card control apparatus according to
- 20 Claim 1, wherein the specific card standards include a PCMCIA standard.
3. The PC card control apparatus according to Claim 1, wherein the second PC card is compatible with
- 25 one of a USB2.0 bus interface and a PCIexpress bus interface.

4. The PC card control apparatus according to Claim 1, wherein the interconnection switching circuit includes an analog switch.

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5. The PC card control apparatus according to Claim 1, wherein the interconnection switching circuit includes a USB hub.

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6. The PC card control apparatus according to Claim 1, further comprising:

a power supply voltage switching circuit configured to switch power supply voltages including first and second power supply voltages supplied to the PC card connector based on the detection signal.

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7. The PC card control apparatus according to Claim 6, wherein the first power supply voltage is 3.3 volts and the second power supply voltage is 5 volts.

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8. The PC card control apparatus according to Claim 6, wherein the power supply voltage switching circuit comprises:

a power switching portion configured to issue a power supply control signal based on the detection signal; and

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a first power switch configured to output to the PC card connector the first power supply voltage indicated by the power supply control signal from the power switching portion.

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9. The PC card control apparatus according to Claim 8, wherein the power switching portion of the power supply voltage switching circuit is mounted on the PC card control apparatus and the first power switch is provided outside the PC card control apparatus.

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10. The PC card control apparatus according to Claim 8, further comprising:

a second power switch configured to be activated upon insertion of the second PC card after receiving the first power supply voltage from the first power switch and to output in a predetermined time period a signal informing the first power supply voltage becomes stable.

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11. The PC card control apparatus according to Claim 1, wherein amongst components of the PC card control apparatus at least the card detector, the interconnection switching circuit, and the power switching portion are integrated into a one-chip IC.

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12. A PC card control apparatus, comprising:

providing means for providing connections for
connecting one of a first PC card compliant with specific
card standards and a card-adapting card for connecting a
second PC card compliant with a different card standard
5 to the PC card control apparatus;

detecting means for detecting insertion of the
card-adapting card in the PC card control apparatus and
subsequently outputting a detection signal; and

switching means for switching the connections
10 provided by the providing means to connect the card-
adapting card to a bus interface dedicated to the second
PC card upon receiving the detection signal from the
detecting means.

15 13. The PC card control apparatus according to
Claim 12, wherein the specific card standards include a
PCMCIA standard.

20 14. The PC card control apparatus according to
Claim 12, wherein the second PC card is compatible with
one of a USB2.0 bus interface and a PCIexpress bus
interface.

25 15. The PC card control apparatus according to
Claim 12, wherein the switching means includes an analog
switch.

16. The PC card control apparatus according to
Claim 12, wherein the switching means includes a USB hub.

5 17. The PC card control apparatus according to
Claim 12, further comprising:

altering means for altering power supply voltages
including first and second power supply voltages supplied
to the connections provided by the providing means based
10 on the detection signal.

18. The PC card control apparatus according to
Claim 17, wherein the first power supply voltage is 3.3
volts and the second power supply voltage is 5 volts.

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19. The PC card control apparatus according to
Claim 17, wherein the altering means comprises:

issuing means for issuing a power supply control
signal based on the detection signal; and

20 sending means for sending to the connections the
first power supply voltage indicated by the power supply
control signal from the issuing means.

20. The PC card control apparatus according to
25 Claim 19, wherein the issuing means of the altering means
is mounted on the PC card control apparatus and the

sending means is provided outside the PC card control apparatus.

21. The PC card control apparatus according to
5. Claim 19, further comprising:

outputting means for operating upon insertion of
the second PC card after receiving the first power supply
voltage from the sending means and outputting in a
predetermined time period a signal informing the first
10 power supply voltage becomes stable.

22. The PC card control apparatus according to
Claim 12, wherein amongst components of the PC card
control apparatus at least the detecting means, the
15 switching means, and the issuing means are integrated
into a one-chip IC.

23. A method of controlling connections of first
and second PC cards, the method comprising the steps of:
20 providing a PC card connector having connections
for connecting one of a first PC card compliant with
specific card standards and a card-adapting card having a
connection for connecting a second PC card compliant with
a different card standard to a PC card control apparatus;
25 detecting insertion of the card-adapting card in
the PC card control apparatus;

outputting a detection signal upon a time the
detecting step detects the insertion of the card-adapting
card; and

switching the connections of the PC card connector
5 to connect the PC card connector to a bus interface
dedicated to the second PC card upon receiving the
detection signal output by the outputting step.

24. The method according to Claim 23, wherein the
10 specific card standards include a PCMCIA standard.

25. The method according to Claim 23, wherein the
second PC card is compatible with one of a USB2.0 bus
interface and a PCIexpress bus interface.

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26. The method according to Claim 23, wherein the
switching step switches the connections with an analog
switch.

20 27. The method according to Claim 23, wherein the
switching step switches the connections with a USB hub.

28. The method according to Claim 23, the method
further comprising the steps of:

25 altering power supply voltages including first and
second power supply voltages supplied to the PC card

connector based on the detection signal.

29. The method according to Claim 28, wherein the first power supply voltage is 3.3 volts and the second
5 power supply voltage is 5 volts.

30. The method according to Claim 28, wherein the altering step comprises the steps of:

issuing a power supply control signal based on the
10 detection signal; and

sending the first power supply voltage indicated by the power supply control signal issued by the issuing step.

31. The method according to Claim 30, wherein the issuing step issues a power supply control signal in the PC card control apparatus and the sending step sends the first power supply voltage from outside of the PC card control apparatus.
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32. The method according to Claim 30, the method further comprising the steps of:

waiting for insertion of the second PC card in the card-adapting card; and

25 outputting, in a predetermined time period after receiving the first power supply voltage, a signal

informing the first power supply voltage becomes stable.

33. The method according to Claim 23, wherein components of the PC card control apparatus, except for a component related to a power supply, are integrated into a one-chip IC.

34. A PC card control apparatus, comprising:
a PC card connector configured to provide
10 connections for connecting one of a first PC card compliant with specific card standards and a second PC card compliant with a different card standard to the PC card control apparatus;
a card detector configured to detect insertion of
15 the second PC card in the PC card control apparatus and to subsequently output a detection signal; and
an interconnection switching circuit configured to switch the connections of the PC card connector to connect the PC card connector to a bus interface
20 dedicated to the second PC card upon receiving the detection signal from the card detector.

35. The PC card control apparatus according to Claim 34, wherein the specific card standards include a PCMCIA standard.

36. The PC card control apparatus according to Claim 34, wherein the second PC card is compatible with one of a USB2.0 bus interface and a PCIexpress bus interface.

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37. The PC card control apparatus according to Claim 34, wherein the interconnection switching circuit includes an analog switch.

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38. The PC card control apparatus according to Claim 34, wherein the interconnection switching circuit includes a USB hub.

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39. The PC card control apparatus according to Claim 34, further comprising:

a power supply voltage switching circuit configured to switch power supply voltages including first and second power supply voltages supplied to the PC card connector based on the detection signal.

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40. The PC card control apparatus according to Claim 39, wherein the first power supply voltage is 3.3 volts and the second power supply voltage is 5 volts.

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41. The PC card control apparatus according to Claim 39, wherein the power supply voltage switching

circuit comprises:

a power switching portion configured to issue a power supply control signal based on the detection signal; and

5 a first power switch configured to output to the PC card connector the first power supply voltage indicated by the power supply control signal from the power switching portion.

10 42. The PC card control apparatus according to Claim 41, wherein the power switching portion of the power supply voltage switching circuit is mounted on the PC card control apparatus and the first power switch is provided outside the PC card control apparatus.

15 43. The PC card control apparatus according to Claim 34, wherein amongst components of the PC card control apparatus, at least the card detector, the interconnection switching circuit, and the power
20 switching portion are integrated into a one-chip IC.

44. A PC card control apparatus, comprising:
providing means for providing connections for
connecting one of a first PC card compliant with specific
25 card standards and a second PC card compliant with a
different card standard to the PC card control apparatus;

detecting means for detecting attachment of the second PC card to the PC card control apparatus and subsequently outputting a detection signal; and

switching means for switching the connections
5 provided by the providing means to connect the card-adapting card to a bus interface dedicated to the second PC card upon receiving the detection signal from the detecting means.

10 45. The PC card control apparatus according to Claim 44, wherein the specific card standards include a PCMCIA standard.

15 46. The PC card control apparatus according to Claim 44, wherein the second PC card is compatible with one of a USB2.0 bus interface and a PCIexpress bus interface.

20 47. The PC card control apparatus according to Claim 44, wherein the switching means includes an analog switch.

 48. The PC card control apparatus according to Claim 44, wherein the switching means includes a USB hub.

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 49. The PC card control apparatus according to

Claim 44, further comprising:

altering means for altering power supply voltages including first and second power supply voltages supplied to the connections provided by the providing means based
5 on the detection signal.

50. The PC card control apparatus according to Claim 49, wherein the first power supply voltage is 3.3 volts and the second power supply voltage is 5 volts.

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51. The PC card control apparatus according to Claim 49, wherein the altering means comprises:

issuing means for issuing a power supply control signal based on the detection signal; and

15 sending means for sending to the connections the first power supply voltage indicated by the power supply control signal from the issuing means.

52. The PC card control apparatus according to
20 Claim 51, wherein the issuing means of the altering means is mounted on the PC card control apparatus and the sending means is provided outside the PC card control apparatus.

25 53. The PC card control apparatus according to Claim 44, wherein amongst components of the PC card

control apparatus at least the detecting means, the switching means, and the issuing means are integrated into a one-chip IC.

5 54. A method of controlling connections of first and second PC cards, the method comprising the steps of:
 providing a PC card connector having connections for connecting one of a first PC card compliant with specific card standards and a second PC card compliant
10 with a different card standard to a PC card control apparatus;

 detecting connection of the second PC card to the PC card control apparatus;

 outputting a detection signal upon a time the
15 detecting step detects the connection of the second PC card; and

 switching the connections of the PC card connector to connect the PC card connector to a bus interface dedicated to the second PC card upon receiving the
20 detection signal output by the outputting step.

 55. The method according to Claim 54, wherein the specific card standards include a PCMCIA standard.

25 56. The method according to Claim 54, wherein the second PC card is compatible with one of a USB2.0 bus

interface and a PCIexpress bus interface.

57. The method according to Claim 54, wherein the
switching step switches the connections with an analog
5 switch.

58. The method according to Claim 54, wherein the
switching step switches the connections with a USB hub.

10 59. The method according to Claim 54, the method
further comprising the steps of:

altering power supply voltages including first and
second power supply voltages supplied to the PC card
connector based on the detection signal.

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60. The method according to Claim 59, wherein the
first power supply voltage is 3.3 volts and the second
power supply voltage is 5 volts.

20 61. The method according to Claim 59, wherein the
altering step comprises the steps of:

issuing a power supply control signal based on the
detection signal; and

sending the first power supply voltage indicated by
25 the power supply control signal issued by the issuing
step.

62. The method according to Claim 61, wherein the issuing step issues a power supply control signal in the PC card control apparatus and the sending step sends the first power supply voltage from outside of the PC card control apparatus.

63. The method according to Claim 54, wherein components of the PC card control apparatus, except for a component related to a power supply, are integrated into a one-chip IC.

64. A passive-card-adapting card, comprising:
a first card connector configured to be compatible with specific card standards for a first PC card and to connect the passive-card-adapting card to a PC card control apparatus;
a second card connector configured to have a connection for connecting a second PC card compliant with a card standard different from the specific card standards for the first PC card; and
a regulator configured to regulate a power supply voltage supplied by the PC card control apparatus in order to adapt the power supply voltage for the second PC card.

65. The passive-card-adapting card according to Claim 64, wherein the first PC card standards include a PCMCIA standard.

5 66. The passive-card-adapting card according to Claim 64, wherein the second PC card is compatible with one of a USB2.0 bus interface and a PCIexpress bus interface.

10 67. The passive-card-adapting card according to Claim 64, further comprising:

 a power switch configured to be activated upon insertion of the second PC card after receiving the power supply voltage from the regulator and to output in a
15 predetermined time period a signal informing the power supply voltage becomes stable.

 68. A passive-card-adapting card, comprising:
 connecting means for being compatible with specific
20 card standards for a first PC card and connecting the passive-card-adapting card to a PC card control apparatus;

 providing means for providing a connection for connecting a second PC card compliant with a card
25 standard different from the specific card standards for the first PC card; and

regulating means for regulating a power supply voltage supplied by the PC card control apparatus in order to adapt the power supply voltage for the second PC card.

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69. The passive-card-adapting card according to Claim 68, wherein the first PC card standards include a PCMCIA standard.

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70. The passive-card-adapting card according to Claim 68, wherein the second PC card is compatible with one of a USB2.0 bus interface and a PCIexpress bus interface.

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71. The passive-card-adapting card according to Claim 68, further comprising:

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outputting means for operating upon insertion of the second PC card after receiving the power supply voltage from the regulating means and outputting in a predetermined time period a signal informing the power supply voltage becomes stable.

72. A method of controlling a passive-card-adapting card, comprising the steps of:

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providing a connection for connecting the passive-card-adapting card to a PC card control apparatus, the

passive-card-adapting card being compatible with specific card standards for a first PC card;

regulating a power supply voltage supplied by the PC card control apparatus in order to adapt the power supply voltage for a second PC card compliant with a card standard different from the specific card standards for the first PC card; and

providing a connection for connecting the second PC card.

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73. The method according to Claim 72, wherein the first PC card standards include a PCMCIA standard.

74. The method according to Claim 72, wherein the second PC card is compatible with one of a USB2.0 bus interface and a PCIexpress bus interface.

75. The method according to Claim 72, the method further comprising the steps of:
waiting for connection of the second PC card to the passive-card-adapting card; and

outputting, in a predetermined time period after receiving the power supply voltage, a signal informing the power supply voltage becomes stable.

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